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Association Between Serious Psychological Distress and Health Care Use and Expenditures by Cancer History

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Abstract

BACKGROUND—Serious psychological distress (SPD) is associated with adverse health outcomes such as poor quality of life and shorter survival in cancer survivors, but to the authors' knowledge, the relationship between SPD and health care use and medical expenditures is not clear.

METHODS—A total of 4326 cancer survivors and 57,109 noncancer participants were identified from the 2008 through 2010 Medical Expenditure Panel Survey, a nationwide population-based survey, and their psychological distress was assessed with the 6-item Kessler Psychological Distress Scale (SPD defined by a score ≥13). The association between SPD and use and medical expenditures of various types of health care (office-based, outpatient, hospital inpatient, emergency department, dental, and prescriptions) was examined using a 2-part modeling approach that adjusted for demographic, personal, and comorbidity factors. The marginal effects of SPD on health care use and expenditures were calculated for cancer survivors and were compared with those of noncancer participants.

RESULTS—The weighted prevalence of SPD in cancer survivors was 8.2% compared with 4.8% in the noncancer participants. SPD was significantly associated with higher use of all care types except dental care in cancer survivors. Cancer survivors with SPD spent $4431 (95% confidence interval, $3419-$5443) more than survivors without SPD on medical services each year, whereas this extra expenditure associated with SPD for participants without cancer was $2685 (95% confidence interval, $2099-$3271).

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CONFLICT OF INTEREST DISCLOSURES

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CONCLUSIONS—In a national representative sample of cancer survivors, SPD was found to be associated with higher health care use and medical expenditures. Distress screening and psychosocial care in cancer survivors may help reduce the economic burden of cancer in the United States.

Keywords

psychological distress; health care use; medical expenditures; psychosocial care

INTRODUCTION

Cancer survivors face multiple and often chronic stressors from their diagnosis and treatment, such as infertility, cardiac dysfunction, limited employment opportunities, difficulty obtaining health insurance, financial limitations, and psychosocial stressors such as fear of cancer recurrence.[1] As addressed in the Institute of Medicine's seminal 2008 report Cancer Care for the Whole Patient: Meeting Psychosocial Health Needs,[2] these stressors make cancer survivors prone to psychological distress, which is often unrecognized and undertreated.[1,3] Serious psychological distress (SPD) is manifested by a set of behavioral, emotional, cognitive, and psychophysiological symptoms reported at a severe level indicative of a high likelihood of diagnosable conditions such as mood or anxiety disorders.[4,5] With an estimated prevalence of approximately 5% in the general US population,[6] SPD is associated with several adverse health outcomes such as higher mortality and lower quality of life.[3,5,7] However, to our knowledge, the relationship between psychological distress and health care use and/or medical expenditures has not been previously examined among cancer survivors. Insights regarding this relationship will inform estimates concerning the economic impact of psychological distress and the potential value of distress screening and psychosocial intervention in cancer care.

We used data from the nationally representative Medical Expenditure Panel Survey (MEPS) to illuminate this relationship. Our secondary aim was to determine whether the association between SPD and health care use/expenditure in cancer survivors is different from that of individuals never diagnosed with cancer. In addition to the overall population of cancer survivors, we also examined these associations in survivors of the 3 most prevalent cancer types: female breast cancer, prostate cancer, and colorectal cancer. Other cancer types were not examined separately because of an insufficient number of cases.

MATERIALS AND METHODS

Data Source and Study Sample

The data for the current study were obtained from the respondents to the MEPS Household Component survey for 2008 through 2010 who were aged ≥18 years. The MEPS is an ongoing household survey cosponsored by the Agency for Healthcare Research and Quality and the National Center for Health Statistics of the Centers for Disease Control and Prevention. Each year, MEPS collects data from a sample panel of families and individuals drawn from households who participated in the prior year's National Health Interview Survey, a nationally representative sample of the US civilian noninstitutionalized

population. The panel is followed for 2 years in 5 rounds of in-person interviews with a family member who typically responds for all family members in the household. During the interview, MEPS collects detailed information regarding demographic characteristics, health conditions, health status, use of medical services, charges and source of payments, access to care, satisfaction with care, health insurance coverage, income, and employment. At the time of completion of the household interview, a sample of medical providers are contacted by telephone to obtain information that household respondents cannot accurately provide, and the information is used to supplement household-reported information concerning health care use and expenditures. Additional information regarding the design and content of MEPS can be found elsewhere.[8,9]

Cancer survivors were identified from a survey question that asked whether a person was ever told by a physician or other health professional that he/she had cancer or a malignancy of any kind; if the respondent answered yes, follow-up questions were asked regarding cancer type and age at the time of diagnosis. Excluding those respondents who only reported nonmelanoma skin cancer, there were 5102 records of cancer survivors out of 102,767 observations in the combined data set for 2008 through 2010. Also excluded were those individuals who were missing information regarding psychological distress (N = 634), age at cancer diagnosis (N = 97), and/or those respondents for whom cancer was diagnosed after psychological distress was measured during the year (N = 45), leaving 4326 cancer survivors (including 803 survivors of female breast cancer, 596 survivors of prostate cancer, and 285 survivors of colorectal cancer). There were 57,109 records for individuals with no record of cancer with known SPD status that were included in the analysis for the secondary objective.

Primary Independent Variable

MEPS uses a well-validated and widely used 6-question scale developed by Kessler et al (K6)[10] to measure psychological distress. The K6 questions were asked at rounds 2 and 4 through the adult self-administered questionnaire. The K6 includes questions regarding the frequency of 6 symptoms (feeling nervous, hopeless, restless or fidgety, so sad that nothing could cheer you up, that everything was an effort, and worthless) during the past 30 days. Five frequency options are given (none of the time, a little of the time, some of the time, most of the time, and all of the time) and scored on a scale of 0 to 4, respectively, such that the total score ranges from 0 to 24. SPD is defined as a score of ≥13 as recommended by Kessler et al.[4] The K6 has been well validated in various populations and has demonstrated excellent internal consistency and reliability.[11]

Outcome Variables

We examined 7 categories of health services use using the following outcomes: the number of office-based medical provider visits (not including medical care provided in other settings such as a hospital, nursing home, or an individual's home), the number of hospital outpatient visits, the number of hospital inpatient discharges, the number of emergency department visits, the number of dental visits, the number of home health care visits, and the number of prescribed medicines. We also examined the medical expenditures for the above 7 categories as well as the total medical expenditure.

Other Variables

The following variables were reported during the interview and were recoded when needed according to the distribution of the cancer survivors in this analysis: age (18-54 years, 55-64 years, 65-74 years, 75-84 years, and ≥85 years), race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, and other), sex, education level (<high school, high school graduate, some college, and ≥college graduate), marital status (married or not), poverty status (defined by the family income as a percentage of the poverty line, coded as poor/negative [<100%], near poor [100% to <125%], low [125% to <200%], medium [200% to <400%], and high [≥400%]), region (North-east, Midwest, South, and West), health insurance status (any private, public only, and uninsured), body mass index (BMI) (<18.5 kg/m^2, 18.5-24.9 kg/m^2, 25-29.9 kg/m^2, and ≥30 kg/m^2), current smoking status (yes vs no), current physical activity (yes/no moderate or vigorous physical activity 3 times per week), the history of 13 common chronic conditions (coronary heart disease, angina, myocardial infarction, other unspecified heart disease, hypertension, stroke, emphysema, chronic bronchitis, high cholesterol, diabetes, arthritis, asthma, and attention deficit hyperactivity disorder/attention deficit disorder).[12] We used the chronic condition information to calculate and group the number of comorbid illnesses (0, 1, 2, and ≥3). We calculated the time since cancer diagnosis by subtracting the reported age at the time of the cancer diagnosis from the age at the time of the survey.

Statistical Analysis

Descriptive analyses were conducted to characterize the cancer survivors and noncancer participants by SPD status. Weighted percentages for all demographic and clinical factors were calculated, and Wald chi-square tests were used to compare the differences between participants with SPD and those without SPD. Next, we calculated the weighted percentages of participants who had any health care use and medical expenditures in the 7 categories and compared these percentages between SPD status groups using Wald chi-square tests.

For each of the outcome variables, we used a 2-part modeling[13,14] approach with a logistic regression in part 1 and Poisson regression (for health use variables) or generalized gamma regression with log link (for medical expenditure variables) in part 2 to account for the 0 values in the use and expenditures data. The predicted probability of incurring any health care use or expenditure from part 1 and the estimated effect of SPD status on health care use or expenditure were multiplied to produce each person's expected health care use or expenditures. Weighted marginal effects of SPD on health care use and expenditures were estimated for individuals who were never diagnosed with cancer, cancer survivors overall, and survivors of the 3 most prevalent types of cancer. The models were adjusted for the following factors: age, race/ethnicity, sex, marital status, poverty status, health insurance status, BMI, smoking, physical activity, and number of comorbid conditions. These potential confounders were selected based on previous literature concerning risk factors of psychological distress[15,16] and determinants of medical care use according to the model developed by Andersen and Newman.[17]

To assess the potential confounding from intensive treatment during the first 2 years after a cancer diagnosis, we conducted a sensitivity analysis excluding those cancer survivors who

were diagnosed <2 years before the survey, and the findings did not change. Many patients with breast cancer undergo hormonal therapy for years after the end of primary treatment. Certain survivors of prostate cancer also receive hormonal therapy as part of cancer treatment and palliative care. To access the potential confounding effect from hormonal therapy on the association between psychological distress and prescription use and expenditures, we performed a sensitivity analysis in which patients with breast cancer and patients with prostate cancer who were diagnosed within 10 years (ie, those survivors most likely to be receiving hormonal therapy) were excluded, and the findings did not change.

Finally, we estimated the annual excess cost associated with SPD among cancer survivors in the United States by multiplying the estimated extra expenditure per cancer survivor associated with SPD and the weighted number of cancer survivors with SPD in this nationwide sample.

STATA statistical software (version 12.1; StataCorp, College Station, Tex) was used for the 2-part model analysis, and SAS statistical software (version 9.3; SAS Institute Inc, Cary, NC) was used in all other analyses.

RESULTS

The characteristics of survey respondents by cancer status and SPD status are reported in Table 1. The weighted prevalence of SPD and its 95% confidence interval (95% CI) were 5.1% (95% CI, 4.8%-5.4%) in all participants, 8.2% (95% CI, 7.1%-9.3%) in the subset of cancer survivors, and 4.8% (95% CI, 4.6%-5.1%) in participants never diagnosed with cancer. Regardless of cancer status, individuals with SPD tended to be less educated and poorer; were more likely to be female, unmarried, obese, physically inactive, and a smoker; reported ≥3 comorbid illnesses; and were less likely to have private health insurance (Table 1). Cancer survivors with SPD also tended to be younger than survivors without SPD (Table 1).

Regardless of SPD status, approximately 98% of cancer survivors had some medical expenditure during the year; among noncancer participants, 83% of those without SPD and 91% of those with SPD had some medical expenditures (Table 2). When each type of health care was examined individually, those survivors with SPD were found to have a higher frequency of any use/expenditure for most types of health care services except office-based and dental care, compared with cancer survivors without SPD.

In cancer survivors overall, SPD was associated with higher health care use of every service type, with each association being statistically significant except for dental care after adjustment for demographic, medical, and behavioral confounders (Fig. 1). The magnitude of the association did not differ significantly for the 3 common cancer types. We also found that for the noncancer participants in the survey, SPD was similarly significantly associated with higher use of office-based care, hospital outpatient care, hospital inpatient care, and emergency department visits. However, we observed that the marginal effects of SPD on the number of prescriptions were notably larger in cancer survivors compared with noncancer participants (9.7 vs 6.3) (Fig. 1). The frequency of home health care use was too small for

estimation, and therefore is not shown on the graphs. For medical expenditures, after adjusting for confounders, cancer survivors spent an average of $7927 each year and noncancer participants spent an average of $3972 each year. Cancer survivors with SPD spent $4431 (95% CI, $3419-$5443) more than those without SPD every year, whereas among noncancer participants, the extra expenditure associated with SPD was $2685 (95% CI, $2099-$3271) per year (Fig. 2). Regardless of cancer status, individuals with SPD spent more than those without SPD in every care type, and this was found to be statistically significant for the use of office-based providers and for prescriptions (Fig. 2). There were no variations evident among survivors of the 3 most common cancer types.

Finally, by multiplying the estimated extra expenditure associated with SPD among cancer survivors ($4431) and the weighted number of cancer survivors with SPD in the United States (1,467,020), we estimated that cancer survivors with SPD spent an additional $6.5 billion in health care annually.

DISCUSSION

In this nationally representative sample of noninstitutionalized US adults conducted between 2008 and 2010, the prevalence of SPD was 5.1% for general participants and 8.2% for cancer survivors. These estimates are consistent with other recent studies of the general US population[6] and cancer survivors,[18,19] although they are both slightly higher than the estimates obtained from data of earlier years.[16,20-22] Using this population-based national sample, the current study illustrates for what we believe to be the first time the association between psychological distress and health care use and medical expenditure by service type among cancer survivors. We found that SPD was significantly associated with higher use of almost all types of heath care except dental care, as well as higher total medical expenditures, office-based expenditures, and prescription expenditures in cancer survivors. Although the same association was also identified in noncancer participants, the increase in prescription and total expenditures associated with SPD was notably larger in cancer survivors compared with noncancer participants.

Examining the comparisons for each care type further (Fig. 2), we found that the main contributors to the greater effects of SPD on total expenditures noted among cancer survivors were office-based care expenditures and prescription expenditures, suggesting that cancer survivors with SPD may be particularly in need of these 2 types of services. In the general population, the higher physician visit and prescription expenditures associated with SPD may be attributable to increased mental health visits and medication use,[6] whereas cancer survivors with SPD may not only have higher mental health visit and medication expenditures, but also higher rates of cancer-related physician visits and prescriptions compared with survivors without SPD. This synergic effect of cancer and SPD may partly explain the stronger association observed between SPD and health care use/expenditures for cancer survivors compared with noncancer controls.

Although psychosocial care is recognized as an essential part of quality cancer care,[23,24] reports and guidelines supporting psychosocial care are based on the strong evidence that psychosocial stress is adversely associated with multiple health outcomes such as quality of

life, symptoms, health behaviors, and survival.[3,25] The results of the current study further suggest that addressing psychosocial needs may not only improve the quality of cancer care but also may reduce the economic and service burden of cancer to society. We estimated that an excess of $6.5 billion associated with SPD among cancer survivors was spent by the nation annually. Although the current study was a cross-sectional survey, the findings regarding the association between SPD and increased health care use and medical expenditures suggest that interventions to reduce SPD could have economic benefits. This is supported by several cost-effectiveness studies of psychosocial interventions in cancer care.[26,27] However, despite the growing public and professional awareness of the importance of psychosocial care, basic conversations regarding psychological concerns have yet to be adequately addressed. A recent survey conducted by the American Psychosocial Oncology Society found that routine screening for distress was not offered in a majority of cancer care organizations despite the recommendations of the Institute of Medicine and the National Comprehensive Cancer Network.[28] Another recent study with a nationwide population-based sample of 1777 cancer survivors demonstrated that the majority of survivors reported neither provider discussion nor the use of professional counseling or support groups.[29] Screening and early psychological intervention for distress may improve quality of life and mitigate both the symptoms and increased health care expenditures associated with comorbid psychiatric conditions such as depression and anxiety.[30,31] Furthermore, given the projected imbalance between the demand for and supply of oncology services for cancer survivors and shortages of primary care providers,[32] it is important to maximize the efficiency and efficacy of follow-up care with the limited workforce and to understand the pattern of health care use related to psychosocial distress. Another way of promoting efficient yet appropriate survivorship care is risk-stratified care, in which the care provider and frequency of follow-up depend on patient needs and health risks.[33,34] The finding in the current study that SPD is associated with higher health care use and medical expenditures suggests that psychological distress may be an important factor to consider in the risk stratification, although more work is needed to fully understand how to stratify survivors to ensure appropriate, comprehensive, and sustainable survivorship care.

The current study was subject to several limitations. First, no causal relationship can be inferred given the cross-sectional study design, although it is useful in estimating the economic burden of SPD in cancer survivors. In addition, MEPS does not collect data regarding cancer stage and severity, type of cancer treatment, or cancer recurrence, variables that could influence SPD and health care use. The sample size for many cancer sites was small, reflecting the prevalence of different cancer types in the population, and therefore we were only able to examine subgroup differences for the 3 largest groups: breast, prostate, and colorectal cancer survivors. There is a possibility that the association between SPD and health care use is confounded by additional variables such as comorbid medical conditions or general health status. We attempted to minimize potential confounding by controlling for the number of comorbid conditions in the analysis as well as BMI, smoking status, and physical activity, variables that could be associated with both psychological distress and health care use. However, a more in-depth assessment of confounding requires longitudinal data and should be evaluated in future studies. Note that the findings of the current study regarding the associations between SPD and health care use and expenditures do not inform

us about the relationship between specific psychiatric conditions and health care use and expenditures as typically examined in the literature,[30,31] yet the results of the current study provide insights into the medical expenditures associated with more global signs of psychological distress that may be common in real-world clinical settings. Nevertheless, we believe the current study contributes to the field with its unique strengths: it is nationally representative, it includes adult cancer survivors of all ages; it provides comparison with individuals without cancer; and the expenditures were from all payers, including out-of-pocket expenses incurred by patients.

SPD in cancer survivors is significantly associated with the higher use of office-based care, outpatient care, inpatient care, emergency department, and more prescriptions, as well as total medical expenditures. The results of the current study suggest that integrating psychosocial support in cancer care has the potential to reduce the economic burden of cancer. Moving forward, research is needed to identify models of cancer care delivery that address SPD and optimize psychosocial functioning at different phases of survivorship and among various subgroups. In addition, future studies may collect data regarding the range of costs and benefits associated with different models of care to inform health care providers, payers, and other individuals who are involved in making decisions concerning the delivery of cancer treatment and follow-up care.

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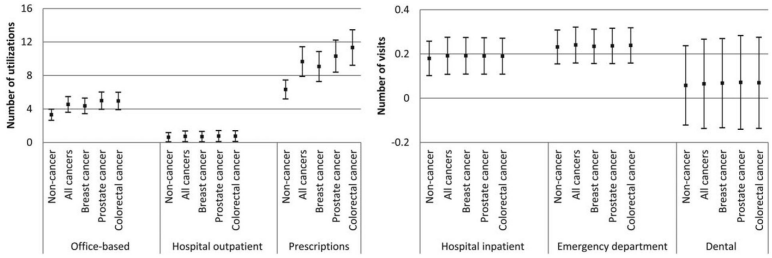

Figure 1.

Marginal effects of serious psychological distress status on health care use are shown from the Medical Expenditure Panel Survey (MEPS), 2008 to 2010.

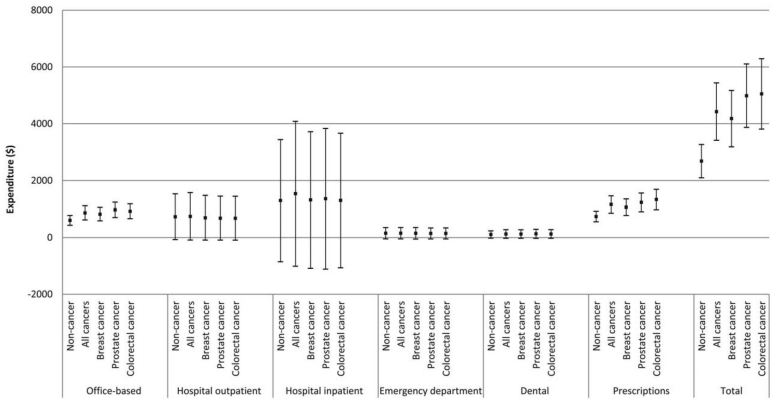

Figure 2.

Marginal effects of serious psychological distress status on medical expenditures are shown from the Medical Expenditure Panel Survey (MEPS), 2008 to 2010.

TABLE 1

Characteristics by SPD Status, MEPS 2008 Through 2010

	Cancer Survivors					Noncancer Participants				
	No SPD		SPD			No SPD		SPD		
Characteristic	No. in Sample	Weighted %	No. in Sample	Weighted %	*P* [a]	No. in Sample	Weighted %	No. in Sample	Weighted %	*P* [a]
Total	3909	91.8	417	8.2		53,964	95.2	3145	4.8	
Age, y					<.0001					.0017
18-54	1082	25.1	191	42.9		40,181	72.7	2149	69.0	
55-64	878	23.1	96	23.1		7363	14.6	551	17.6	
65-74	931	24.5	63	17.6		3793	7.3	242	6.9	
75-84	756	20.3	42	8.7		1988	4.0	146	4.6	
≥85	262	7.0	25	7.7		639	1.3	57	1.9	
Race/ethnicity					.0704					.0069
Non-Hispanic white	2852	85.6	272	80.4		24,231	66.3	1376	63.7	
Non-Hispanic black	520	6.5	56	7.2		10,249	11.8	696	13.6	
Hispanic	364	4.9	70	8.8		14,311	14.7	832	16.2	
Other	173	3.0	19	3.6		5173	7.1	241	6.5	
Sex					.0186					
Male	1552	41.9	125	33.3		25,185	49.4	1259	43.0	<.0001
Female	2357	58.1	292	66.7		28,779	50.6	1886	57.0	
Education [b]					<.0001					<.0001
<High school	721	14.0	145	27.2		12,296	16.1	1169	30.4	
High school graduate	1245	32.2	139	38.7		16,560	30.4	1058	36.2	
Some college	901	23.0	84	21.4		12,260	24.5	593	20.8	
≥College graduate	1027	30.8	44	12.6		12,393	29.0	295	12.5	
Marital status					.0002					<.0001
Not married	1637	39.0	247	53.5		25,660	46.0	1906	59.7	
Married	2272	61.0	170	46.5		28,304	54.0	1239	40.3	
Poverty status					<.0001					<.0001
Poor/negative	530	8.6	138	23.3		8953	11.2	1147	30.0	

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Characteristic	Cancer Survivors					Noncancer Participants				
	No SPD		SPD			No SPD		SPD		
	No. in Sample	Weighted %	No. in Sample	Weighted %	*P* [a]	No. in Sample	Weighted %	No. in Sample	Weighted %	*P* [a]
Near poor	234	5.1	44	9.7		3039	3.9	279	6.8	
Low income	561	13.5	78	18.9		8662	12.9	600	19.2	
Middle income	1158	28.9	102	27.1		17,015	31.3	746	26.4	
High income	1426	43.8	55	21.1		16,295	40.6	373	17.5	
Region					.4455					.0816
Northeast	585	17.7	62	19.7		8277	18.7	446	16.0	
Midwest	925	23.4	83	18.8		10,675	21.8	615	21.9	
South	1506	37.1	177	38.8		20,455	36.4	1319	39.3	
West	893	21.8	95	22.8		14,557	23.2	765	22.8	
Health insurance					<.0001					<.0001
Any private	2413	67.8	149	44.2		32,646	69.3	1100	42.2	
Public only	1256	27.5	222	46.5		9610	14.1	1345	37.5	
Uninsured	240	4.7	46	9.3		11,708	16.6	700	20.3	
BMI, kg/m^2 [b]					.0007					<.0001
<18.5	62	1.8	9	2.2		833	1.6	75	2.4	
18.5-24.9	1222	33.1	107	27.2		17,240	34.2	808	27.2	
25-29.9	1383	36.8	99	27.6		18,529	35.3	921	29.6	
≥30	1125	28.3	172	43.0		15,916	29.0	1259	40.8	
Smoking status [b]					<.0001					<.0001
No	3238	85.6	259	64.2		43,612	81.6	1914	61.5	
Yes	600	14.4	153	35.8		9465	18.4	1136	38.5	
Physical activity [b]					<.0001					<.0001
Not active	1886	47.3	291	72.8		22,587	39.0	1933	62.2	
Yes active	1966	52.7	108	27.2		30,841	61.0	1170	37.8	
No. of comorbid illnesses					<.0001					<.0001
0	583	14.5	30	7.4		26,004	46.3	775	24.8	
1	730	19.2	53	12.0		11,859	22.5	573	19.1	
2	789	20.2	64	14.1		7152	14.2	486	16.2	

Characteristic	Cancer Survivors					Noncancer Participants				
	No SPD		SPD			No SPD		SPD		
	No. in Sample	Weighted %	No. in Sample	Weighted %	*P* [a]	No. in Sample	Weighted %	No. in Sample	Weighted %	*P* [a]
≥3	1807	46.1	270	66.4		8949	16.9	1311	39.9	
Cancer type[c]										
Breast cancer	740	18.5	63	12.6	.0077					
Prostate cancer	565	14.1	31	8.6	.0116					
Colorectal cancer	255	7.1	30	6.9	.9043					
Other	2360	60.7	296	72.3	.001					
No. of y since diagnosis					.3045					
0-1	556	13.6	65	13.6						
2-5	1028	26.4	103	24.5						
6-10	896	22.9	78	19.0						
≥11	1429	37.1	171	42.9						

Abbreviations: BMI, body mass index; MEPS, Medical Expenditure Panel Survey; SPD, serious psychological distress.

[a] *P* values were derived from Wald chi-square tests.

[b] Sum is less than the total number because of missing values.

[c] Sum is more than the total number because of individuals diagnosed with multiple cancers.

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TABLE 2

Frequency[a] of Health Care Use and Medical Expenditures by SPD Status, MEPS 2008 Through 2010

	Noncancer Participants					All Cancers					Breast Cancer					Prostate Cancer					Colorectal Cancer				
	No SPD		SPD			No SPD		SPD			No SPD		SPD			No SPD		SPD			No SPD		SPD		
	No.	%	No.	%	*P* [b,c]	No.	%	No.	%	*P* [b,c]	No.	%	No.	%	*P* [b,c]	No.	%	No.	%	*P* [b,c]	No.	%	No.	%	*P* [b,c]
Health care use																									
Office-based visit	35,372	70.8	2505	82.3	**<.0001**	3594	93.5	385	92.0	.3138	696	95.5	60	97.7	.2573	533	95.7	30	99.3	**.0195**	242	97.2	25	82.2	.1627
Hospital outpatient visit	7147	15.0	670	22.9	**<.0001**	1344	35.3	171	43.3	**.0153**	296	39.6	30	52.4	.113	175	31.1	9	50.0	.1781	91	32.8	11	30.1	.7993
Hospital inpatient discharge	3764	6.7	508	16.7	**<.0001**	644	16.0	116	27.3	**.0005**	91	11.7	20	27.0	**.0184**	108	18.8	11	40.8	.124	63	23.4	9	27.7	.6211
Emergency department visit	6608	11.8	879	28.2	**<.0001**	749	17.5	149	35.3	**<.0001**	111	13.9	23	29.4	**.0153**	106	16.5	13	41.9	**.0351**	52	18.3	10	23.4	.5238
Dental visit	18,672	40.8	791	28.6	**<.0001**	1867	53.1	107	27.7	**<.0001**	391	60.3	22	38.0	**.0083**	275	54.1	9	43.8	.3801	116	47.8	5	12.2	**.0025**
Home health care visit	895	1.7	251	7.7	**<.0001**	247	5.8	68	16.2	**<.0001**	52	6.1	10	9.7	.3297	38	6.1	7	15.5	.1574	26	9.5	5	19.0	.3592
No. of prescribed medicines	32,367	64.2	2541	82.3	**<.0001**	3525	90.6	394	95.5	**.0011**	678	91.0	58	92.1	.818	529	94.3	30	99.3	**.0135**	239	92.5	28	93.2	.8907
Expenditures																									
Office-based	34,792	69.8	2479	81.4	**<.0001**	3585	93.3	385	92.0	.3894	696	95.5	60	97.7	.2573	533	95.7	30	99.3	**.0195**	242	97.2	25	82.2	.1627
Hospital outpatient	7002	14.7	653	22.2	**<.0001**	1333	35.0	171	43.3	**.0127**	293	39.2	30	52.4	.1018	174	31.0	9	50.0	.1749	91	32.8	11	30.1	.7993
Hospital inpatient	3708	6.7	500	16.4	**<.0001**	638	15.9	115	27.2	**.0006**	91	11.7	20	27.0	**.0184**	108	18.8	11	40.8	.124	62	23.0	9	27.7	.5837
Emergency department	6003	10.8	810	25.9	**<.0001**	699	16.3	142	33.9	**<.0001**	107	13.4	23	29.4	**.0131**	101	15.9	13	41.9	**.0322**	49	16.7	10	23.4	.3955
Dental	18,208	39.9	759	27.6	**<.0001**	1832	52.0	103	26.8	**<.0001**	387	59.6	22	38.0	**.0099**	273	53.8	9	43.8	.3941	113	46.5	5	12.2	**.0032**
Home health care	855	1.6	227	6.8	**<.0001**	226	5.5	71	16.5	**<.0001**	45	5.4	15	17.3	.0503	38	6.3	8	18.7	.1371	22	8.7	6	21.8	.218
Prescriptions	32,347	64.2	2541	82.3	**<.0001**	3524	90.6	394	95.5	**.0011**	678	91.0	58	92.1	.818	529	94.3	30	99.3	**.0135**	239	92.5	28	93.2	.8907
Total expenditures	42,163	82.8	2803	90.6	**<.0001**	3794	97.6	405	97.7	.9415	723	98.4	62	98.6	.8888	558	98.7	30	99.3	.5547	253	99.7	29	94.9	.3398

Abbreviations: MEPS, Medical Expenditure Panel Survey; SPD, serious psychological distress.

[a] Frequency refers to the number in the sample (No.) and weighted percentage (%).

[b] *P* values were derived from Wald chi-square tests.

[c]Bold type indicates statistical significance